LIBRARY
STATE PLANT BOARD

TECHNICAL SERIES, No. 12.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ENTOMOLOGY.
L. O. HOWARD, Entomologist and Chief of Bureau.

MISCELLANEOUS PAPERS.

CONTENTS AND INDEX.

ISSUED DECEMBER 31, 1912.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1912.

SB
823
A25

TECHNICAL SERIES, No. 12.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ENTOMOLOGY.
L. O. HOWARD, Entomologist and Chief of Bureau.

MISCELLANEOUS PAPERS.

I. CATALOGUE OF RECENTLY DESCRIBED COCCIDÆ.
By J. G. SANDERS, M. A., *Assistant.*

II. HABITS AND LIFE HISTORIES OF SOME FLIES OF THE FAMILY TABANIDÆ.
By JAMES S. HINE, *of the Ohio State University, Columbus, Ohio.*

III. A CONTRIBUTION TO OUR KNOWLEDGE OF THE THYSANOPTERA OF CALIFORNIA.
By DUDLEY MOULTON, *Engaged in Deciduous-Fruit Insect Investigations.*

IV. NEW GENERA AND SPECIES OF APHELININÆ, WITH A REVISED TABLE OF GENERA.
By L. O. HOWARD, PH. D.

V. THE MORE IMPORTANT ALEYRODIDÆ INFESTING ECONOMIC PLANTS, WITH DESCRIPTION OF A NEW SPECIES INFESTING THE ORANGE.
By A. L. QUAINTANCE, *In Charge of Deciduous-Fruit Insect Investigations.*

VI. A RECORD OF RESULTS FROM REARINGS AND DISSECTIONS OF TACHINIDÆ.
By CHARLES H. T. TOWNSEND, *Expert in Charge of Dipterous Parasites, Gipsy-Moth Laboratory.*

VII. THE ORANGE THRIPS.
By DUDLEY MOULTON, *Engaged in Deciduous-Fruit Insect Investigations.*

VIII. BIOLOGICAL STUDIES ON THREE SPECIES OF APHIDIDÆ.
By JOHN JUNE DAVIS, *of the University of Illinois, Champaign, Ill.*

IX. A NEW GENUS OF ALEYRODIDÆ, WITH REMARKS ON ALEYRODES NUBIFERA BERGER AND ALEYRODES CITRI RILEY AND HOWARD.
By A. L. QUAINTANCE, *In Charge of Deciduous-Fruit Insect Investigations.*

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1912.

BUREAU OF ENTOMOLOGY.

L. O. Howard, *Entomologist and Chief of Bureau.*
C. L. Marlatt, *Entomologist and Acting Chief in Absence of Chief.*
R. S. Clifton, *Executive Assistant.*
W. F. Tastet, *Chief Clerk.*

F. H. Chittenden, *in charge of truck crop and stored product insect investigations.*
A. D. Hopkins, *in charge of forest insect investigations.*
W. D. Hunter, *in charge of southern field crop insect investigations.*
F. M. Webster, *in charge of cereal and forage insect investigations.*
A. L. Quaintance, *in charge of deciduous fruit insect investigations.*
E. F. Phillips, *in charge of bee culture.*
D. M. Rogers, *in charge of preventing spread of moths, field work.*
Rolla P. Currie, *in charge of editorial work.*
Mabel Colcord, *in charge of library.*

LETTER OF TRANSMITTAL.

United States Department of Agriculture,
Bureau of Entomology,
Washington, D. C., October 5, 1912.

Sir: I have the honor to transmit herewith for publication as Technical Series No. 12, of this bureau, nine papers dealing with the classification, description, or habits and life history of various insects belonging to groups of economic importance.

These papers, prepared by different employees of the bureau and published separately during the years 1906–1908, are as follows: Catalogue of Recently Described Coccidæ, by J. G. Sanders; Habits and Life Histories of some Flies of the Family Tabanidæ, by James S. Hine; A Contribution to our Knowledge of the Thysanoptera of California, by Dudley Moulton; New Genera and Species of Aphelininæ, with a Revised Table of Genera, by L. O. Howard; The More Important Aleyrodidæ Infesting Economic Plants, with Description of a New Species Infesting the Orange, by A. L. Quaintance; A Record of Results from Rearings and Dissections of Tachinidæ, by Charles H. T. Townsend; The Orange Thrips, by Dudley Moulton; Biological Studies on Three Species of Aphididæ, by John June Davis; A New Genus of Aleyrodidæ, with Remarks on Aleyrodes nubifera Berger and Aleyrodes citri Riley and Howard, by A. L. Quaintance.

Respectfully,

L. O. Howard,
Entomologist and Chief of Bureau.

Hon. James Wilson,
Secretary of Agriculture.

Digitized by the Internet Archive
in 2013

http://archive.org/details/miscellaneouspap00unit

CONTENTS[1]

	Page.
Catalogue of recently described Coccidæ ..... *J. G. Sanders*..	1
Subfamily Monophlebinæ.....	2
Subfamily Margarodinæ.....	2
Subfamily Ortheziinæ.....	2
Subfamily Conchaspinæ.....	3
Subfamily Dactylopiinæ.....	3
Subfamily Tachardiinæ.....	6
Subfamily Coccinæ.....	6
Subfamily Diaspinæ.....	10
Habits and life histories of some flies of the family Tabanidæ .. *James S. Hine*..	19
The black-striped horsefly (*Tabanus lasiophthalmus* Macquart).....	19
The autumn horsefly (*Tabanus sulcifrons* Macquart).....	22
The black-and-white horsefly (*Tabanus stygius* Say).....	28
The river horsefly (*Tabanus vivax* Osten Sacken).....	32
The black horsefly (*Tabanus atratus* Fabricius).....	34
The marsh ear fly (*Chrysops mœrens* Walker).....	36
A contribution to our knowledge of the Thysanoptera of California, *Dudley Moulton*.....	39
Introduction.....	39
Classification of California Thysanoptera.....	42
Key to the suborders and families.....	42
Key to the genera.....	42
Key to the species.....	43
Family Æolothripidæ.....	45
Family Thripidæ.....	49
Family Phlœothripidæ.....	60
List of California Thysanoptera and their food plants.....	67
New genera and species of Aphelininæ, with a revised table of genera, *L. O. Howard*.....	69
Introduction.....	69
Subfamily Aphelininæ. Table of tribes.....	71
Tribe I. Aphelinini. Table of genera.....	71
Tribe II. Pteroptricini. Table of genera.....	72
Genus *Marlattiella*.....	73
Genus *Mesidia*.....	73
Genus *Azotus*.....	74
Genus *Encarsia*.....	76
Genus *Prospalta*.....	79
Genus *Coccophagus*.....	80
Genus *Cales*.....	82
Genus *Casca*.....	83
Genus *Bardylis*.....	84
Genus *Artas*.....	85
Genus *Perissopterus*.....	86

[1] The nine papers constituting this bulletin were issued in separate form on June 5, 1906; Aug. 29, 1906; Apr. 5, 1907; July 12, 1907; Oct. 21, 1907; Sept. 18, 1908; Feb. 11, 1909; Feb. 20, 1909, and Sept. 1, 1909.

Page.
The more important Aleyrodidæ infesting economic plants, *A. L. Quaintance*.. 89
Introduction..... 89
Economic plants and the more important Aleyrodidæ infesting them..... 89
A record of results from rearings and dissections of Tachinidæ, *Charles H. T. Townsend*..... 95
Introduction..... 95
Parexorista cheloniæ Rondani..... 97
Blepharipa scutellata Robineau-Desvoidy..... 99
Pales pavida Meigen..... 99
Zenillia libatrix Panzer..... 100
Probability of an extra maggot stage in leaf-ovipositing species..... 101
The deposition of living maggots by tachinid flies..... 101
Dexodes nigripes Fallen and *Compsilura concinnata* Meigen..... 102
Eupeleteria magnicornis Zetterstedt..... 103
Zygobothria nidicola Townsend..... 105
Zygobothria gilva Hartig and *Carcelia gnava* Meigen..... 105
Parasetigena segregata Rondani..... 105
Tachina and allies..... 106
Tachina clisiocampæ Townsend..... 106
Japanese representatives of European species..... 107
Importance of studying the uterine eggs of Tachinidæ..... 107
Reproductive capacity of Tachinidæ..... 109
The rearing of Tachinidæ in confinement..... 110
An improvement in the method of colonizing Tachinidæ..... 111
New alternate hosts for introduced tachinid flies..... 112
Improvements in the outdoor rearing cage..... 113
Bleaching the puparia of Tachinidæ..... 115
Results from dissections of native Tachinidæ..... 115
Summary of reproductive habits now known in the Tachinidæ..... 117
Conclusion..... 118
The orange thrips (*Euthrips citri* n. sp.)..... *Dudley Moulton*.. 119
Introductory..... 119
Distribution..... 119
Extent and nature of injury..... 119
Life history notes..... 120
Soil conditions as affecting prevalence..... 120
Remedies..... 121
Enemy..... 121
Description..... 121
Biological studies on three species of Aphididæ..... *John June Davis*.. 123
Introduction..... 123
The corn root-aphis (*Aphis maidi-radicis* Forbes)..... 123
The corn leaf-aphis (*Aphis maidis* Fitch)..... 144
The sorghum aphis (*Sipha* [*Chaitophorus*] *flava* Forbes)..... 157
A new genus of Aleyrodidæ, with remarks on *Aleyrodes nubifera* Berger and *Aleyrodes citri* Riley and Howard..... *A. L. Quaintance*.. 169
Paraleyrodes, new genus..... 169
Paraleyrodes (*Aleurodicus*) *perseæ* Quaintance..... 170
Remarks on *Aleyrodes nubifera* Berger and *Aleyrodes citri* Riley and Howard..... 173
Index..... 175

ILLUSTRATIONS.

PLATES.

		Page.
PLATE I.	Fig. 1.—*Orothrips kelloggii:* Head and prothorax of female	50
	Fig. 2.—*Orothrips kelloggii:* Left antenna of female	50
	Fig. 3.—*Orothrips kelloggii:* Right fore wing of female	50
	Fig. 4.—*Orothrips kelloggii:* Fore tarsus of female	50
	Fig. 5.—*Æolothrips kuwanaii:* Head and prothorax of female	50
	Fig. 6.—*Æolothrips kuwanaii:* Right antenna of female	50
	Fig. 7.—*Æolothrips kuwanaii:* Right fore wing of female	50
	Fig. 8.—*Æolothrips kuwanaii:* Fore tarsus of female	50
	Fig. 9.—*Sericothrips reticulatus:* Head, prothorax, and mesothorax of female	50
	Fig. 10.—*Sericothrips reticulatus:* End of abdomen of female	50
II.	Fig. 11.—*Sericothrips stanfordii:* Female	52
	Fig. 12.—*Heliothrips fasciatus:* Head and prothorax of female	52
	Fig. 13.—*Heliothrips fasciatus:* Right antenna of female	52
	Fig. 14.—*Heliothrips fasciatus:* End of abdomen of female	52
	Fig. 15.—*Euthrips orchidii:* Head and prothorax of female	52
	Fig. 16.—*Euthrips orchidii:* Right antenna of female	52
	Fig. 17.—*Euthrips orchidii:* End of abdomen of female	52
	Fig. 18.—*Euthrips orchidii:* Right fore wing of female	52
III.	Fig. 19.—*Euthrips pyri:* Head and prothorax of female	54
	Fig. 20.—*Euthrips pyri:* Head and prothorax of female from side	54
	Fig. 21.—*Euthrips pyri:* Right antenna of female	54
	Fig. 22.—*Euthrips pyri:* End of abdomen of female from side	54
	Fig. 23.—*Euthrips pyri:* Fore tarsus of female	54
	Fig. 24.—*Euthrips pyri:* Right fore wing of female	54
	Fig. 25.—*Euthrips ehrhornii:* Head and prothorax of female	54
	Fig. 26.—*Euthrips ehrhornii:* Right fore wing of female	54
	Fig. 27.—*Euthrips ulicis californicus:* Head and prothorax of female.	54
IV.	Fig. 28.—*Euthrips ulicis californicus:* Left antenna of female	56
	Fig. 29.—*Euthrips ulicis californicus:* Right fore wing of female	56
	Fig. 30.—*Euthrips ulicis californicus:* Fore leg of female	56
	Fig. 31.—*Euthrips ulicis californicus:* End of abdomen of male	56
	Fig. 32.—*Euthrips minutus:* Head and prothorax of female	56
	Fig. 33.—*Euthrips minutus:* Right fore wing of female	56
	Fig. 34.—*Thrips madronii:* Head and prothorax of female	56
	Fig. 35.—*Thrips madronii:* Right antenna of female	56
	Fig. 36.—*Thrips madronii:* Right fore wing of female	56
V.	Fig. 37.—*Thrips bremnerii:* Head and prothorax of female	60
	Fig. 38.—*Thrips bremnerii:* End of abdomen of female	60
	Fig. 39.—*Thrips bremnerii:* Right fore wing of female	60
	Fig. 40.—*Trichothrips dens:* Head and prothorax of female	60
	Fig. 41.—*Trichothrips dens:* Left antenna of female	60
	Fig. 42.—*Trichothrips dens:* Right fore wing of female	60

Page.
PLATE V. Fig. 43.—*Trichothrips dens:* End of abdomen of female 60
Fig. 44.—*Trichothrips femoralis:* Right antenna of female 60
VI. Fig. 45.—*Trichothrips femoralis:* Head and prothorax of female 64
Fig. 46.—*Trichothrips femoralis:* End of abdomen of female 64
Fig. 47.—*Trichothrips ilex:* Head and prothorax of female 64
Fig. 48.—*Trichothrips ilex:* Left antenna of female 64
Fig. 49.—*Trichothrips ilex:* Base of right fore wing of female 64
Fig. 50.—*Acanthothrips doaneii:* Head and prothorax of male 64
Fig. 51.—*Acanthothrips doaneii:* Left antenna of male 64
Fig. 52.—*Acanthothrips doaneii:* End of abdomen of male 64
Fig. 53.—*Megalothrips hesperus:* Head and prothorax of female 64
Fig. 54.—*Megalothrips hesperus:* Right antenna of female 64
Fig. 55.—*Megalothrips hesperus:* End of abdomen of female 64
Fig. 56.—*Megalothrips hesperus:* End of abdomen of male 64
VII. Fig. 1.—*Aleyrodes howardi* on orange 92
Fig. 2.—*Aleurodicus anonæ* 92
Fig. 3.—*Aleyrodes vaporariorum* on tobacco 92
VIII. Work of orange thrips (*Euthrips citri* n. sp.).
Fig. 1.—Injury to tender orange shoot 120
Fig. 2.—Orange buds in axils of leaves killed back as fast as formed, preventing further growth 120
Fig. 3.—Scab injury at stem end of orange, due to work of thrips shortly after blossoms fell 120
Fig. 4.—Scab injury at distal end of orange, due to work of thrips late in season 120

TEXT FIGURES.

FIG. 1. *Tabanus lasiophthalmus:* Male and female adults, larva, pupa and details 21
2. *Tabanus sulcifrons:* Male and female adults, pupa and details 23
3. *Vespa maculata:* Adult 26
4. *Tabanus stygius:* Eggs on leaves in usual location 29
5. *Tabanus stygius:* Eggs on leaf in unusual location 30
6. *Tabanus stygius:* Female adult 31
7. *Tabanus stygius:* Pupa and details 31
8. *Tabanus vivax:* Male and female adults, larva, pupa and details 32
9. *Tabanus atratus:* Male and female adults 35
10. *Tabanus atratus:* Pupa and details 36
11. *Chrysops mœrens:* Adult ovipositing 37
12. *Chrysops mœrens:* Egg masses on leaf 38
13. *Marlattiella prima:* Antenna, forewing, and middle leg of female 73
14. *Mesidia mexicana:* Female 74
15. *Azotus capensis:* Female, and antenna of male 75
16. *Prospalta maculata:* Female 80
17. *Coccophagus longifasciatus:* Female 81
18. *Coccophagus zebratus:* Female 82
19. *Cales noacki:* Antenna, forewing, and middle leg of female 83
20. *Casca chinensis:* Forewing, antenna, and middle leg of female 84
21. *Bardylis australiensis:* Antenna of female, and antenna, hind leg, and forewing of male 85
22. *Artas koebelei:* Antenna, forewing, and hind leg of female 86
23. *Aleyrodes howardi:* Showing copious secretion from pupæ, on lower surface of orange leaf 91

Page.
FIG. 24. *Aleyrodes howardi:* Pupa case and details 92
25. Outdoor cage for rearing Tachinidæ, with vestibule 96
26. Outdoor cage for rearing Tachinidæ, showing disposition of "tangle-footed" trays within the cage 97
27. *Eupeleteria magnicornis:* First-stage maggot attached to leaf, awaiting approach of a caterpillar; enlarged mouth-hook of maggot 103
28. Outdoor cage for securing oviposition of Japanese *Tachina*, covered about the door with paper to prevent the flies from congregating at that point 113
29. Glass cylinders in use in rearing Tachinidæ and wire-screen receptacle for inclosing flies with caterpillars on foliage 114
30. *Parachæta* sp.: Uterine egg with chorion removed, showing structure of the fully formed maggot from below 116
31. Periods and succession of generations in *Aphis maidi-radicis*, 1906 127
32. Periods and succession of generations in *Aphis maidi-radicis*, 1906 127
33. Periods and succession of generations in *Aphis maidis*, 1906 147
34. Periods and succession of generations in *Sipha flava*, 1907 159
35. *Paraleyrodes perseæ:* Pupa on leaf, pupa case and details 171
36. *Paraleyrodes perseæ:* Antenna, right forewing, male genitalia, and claw of third leg of adult 172

ERRATA.

Page 18, line 9 from bottom, for *Parlatoria* read *Parlatorea*.
Page 70, line 24, for *bergi* read *bergii*.
Plate VII, facing page 92, for *Aleyrodes anonæ* read *Aleurodicus anonæ*.
Page 93, line 19, for *Spireæ* read *Spirææ*.
Page 105, line 7, after *chitinized* insert comma and omit *anal*.
Page 116, line 3, for *is* read *are*.
Page 122, line 5, for *stop* read *spot*.
Page 153, line 8, for *maidaphides* read *maidaphidis*.

INDEX.

Page.

Abies concolor, *Aspidiotus ehrhorni* taken under lichens thereon 13
food plant of *Leucaspis kelloggi* 12
Physokermes concolor 10
grandis, food plant of *Leucaspis kelloggi* 12
magnifica, food plant of *Leucaspis kelloggi* 12
shastensis, food plant of *Leucaspis kelloggi* 12
Ablerus, characters in table 72
aureonotus, references to original description 70
pulchriceps, parasite of *Aleyrodes longicornis* 76, 90
reference to original description, host 70
Abutilon abutilon, food plant of *Aleyrodes abutilonea* 92
Acacia horrida, food plant of *Diaspis* sp 77
montana, food plant of *Lepidosaphes intermedia victoriæ* 17
sp., food plant of *Aspidiotus subfervens* 14
Acanthothrips, characters in table 43
doanei, food plant 65, 68
in table 45
new species, description 64–65
Aclerda distorta, host of *Coccophagus zebratus* 81
Adialytus maidaphidis, parasite of *Aphis maidis* 153
Æolothripidæ, characters in table 42
description 45
Æolothrips, characters in table 42
description 47
kuwanaii, food plants 48, 67
in table 43
wild California lilac 41
new species, description 47–48
robustus in table 43
new variety, description 48
Ærna lanata, food plant of *Saissetia punctulifera* 10
Æsculus glabra, food plant of *Aspidiotus ohioensis* 14
Agave, food plant of *Pseudococcus ephedræ* 5
mexicana, food plant of *Opuntiaspis javanensis* 18
Ageratum, food plant of *Aleyrodes vaporariorum* 93
Aleurodicus anonæ on *Anona muricata* 93
reticulata 93
sp 93
squamosa 93
cockerelli on guava 92
cocois and scale insect, cause of a widespread disease on cocoanut 92
on cocoanut 92
guava 92
holmesii on guava 92
mirabilis on *Anona* sp 93
perseæ. (See *Paraleyrodes perseæ*.)

Page.
Aleyrodes abutilonea on cotton and *Abutilon abutilon* 92
alcocki on *Ficus indica* and *Ficus religiosa*, parasite 94
aspleni on *Asplenium lucidum* and other ferns 94
aurantii=*Aleyrodes citri* 174
on orange 91
bambusæ on bamboo 94
barodensis on sugar cane 90
bergii, host of *Prospalta tristis* 70
on sugar cane 90
brassicæ on cabbage, kale, and other crucifers 93
citri, occurrence in eastern Asia 174
on citrus plants in greenhouses 94
orange 90
eugeniæ var. *aurantii*=*Aleyrodes citri* 174
fernaldi on strawberry and Spiræa 93
filicium on *Asplenium cuneatum* 93
Oleander articulata 94
Pteris quadriolata 94
fitchi, synonym of *Aleyrodes abutilonea* 92
floridensis on guava 90, 92
orange 90
fragariæ on strawberry 93
gossypii on *Gossypium religiosum* 92
goyabæ on guava 92
horridus on guava 92
howardi, new species, description, on orange 91–92
lacerdæ on *Anona sylvatica* 93
lactea on sugar cane, remedies 90
leakii on *Indigofera arrecta* and *Indigofera tinctoria* 94
longicornis, host of *Ablerus pulchriceps* 76
on sugar cane, remedies 90
marlatti on orange 91
mori arizonensis on orange 90–91
nephrolepidis on fern, Nephrolepis 93
nicotianæ on tobacco 89
nubifera, distribution, food plants 173–174
nubilans on *Piper betle* 94
packardii=*Aleyrodes vaporariorum* 93
on strawberry 93
pergandei on peaches, plums, Cratægus, and wild crab apple 94
perseæ. (See *Paraleyrodes perseæ*.)
ribium on red and black currants 94
(?) on *Vaccinium uliginosum* 94
rolfsii on geranium 94
rubicola on *Rubus* sp 94
rubi on *Rubus fruticosus* 94
ruborum on *Rubus cuneifolius* and *Rubus trivialis* 94
sacchari on sugar cane 90
sp., on blackberry, host of *Encarsia pergandiella* 78
climbing vine, host of *Encarsia portoricensis* 78
coarse grass, host of *Encarsia townsendi* 79
grape (*Vinifera*) 94
"Palo de Gusano," host of *Mesidia mexicana* 74

Page.
Aleyrodes sp., on *Polygonum*, host of *Encarsia quaintancei* 79
sugar cane, host of *Ablerus (Azotus) pulchriceps* 70
tomatoes and other vegetables 93
spinifer on *Citrus* sp. and rose 91
tabaci on tobacco 89–90
vaporariorium, *Aleyrodes packardii* a synonym 93
on greenhouse plants and vegetables 93
youngi on cabbage 93
Aleyrodidæ infesting economic plants 89–94
new genus belonging to the family 169–173
Alfalfa, injury by *Euthrips tritici* 40
Allograpta obliqua, association with *Aphis maidis* 152
Almonds, food plants of *Euthrips pyri* 54, 67
Alnus, food plant of *Pulvinaria innumerabilis betheli* 6
glutinosa, food plant of *Pulvinaria gathei* 6
Alpina nutans, food plant of *Coccus signiferus* 8
Amaranthus hybridus, food plant of *Aphis maidi-radicis* 124
Ambrosia trifida, food plant of *Aphis maidi-radicis* 124
Amelanchier, food plant of *Phenacoccus cockerelli* 4
Amelococcus in catalogue of Coccidæ 4
alluaudi in catalogue of Coccidæ 4
Amiurus melas feeding on horsefly larvæ 30
Amorphococcus mesuæ, *Aspidiotus cuculus* taken in abandoned galls 13
Aneristus, characters in table 72
reference to original description 70
ceroplastæ, reference to original description, host 70
Angleworms, food of *Tabanus stygius* 31
Anisota, alternate host of introduced Tachinidæ 112
Anomianthus heterocarpus, food plant of *Paralecanium expansum javanicum* 9
Anona (*see also* Custard apple).
muricata, food plant of *Aleurodicus anonæ* 93
reticulata, food plant of *Aleurodicus anonæ* 93
sp., food plant of *Aleurodicus anonæ* 93
mirabilis 93
Coccus marsupialis 8
squamosa, food plant of *Aleurodicus anonæ* 93
sylvatica, food plant of *Aleyrodes lacerdæ* 93
Antecerococcus, *Phenacobryum* a synonym 3
Antonina australis in catalogue of Coccidæ 5
Aonidia corniger, host of *Encarsia aonidiæ* 70
crenulata, *Aonidia ebeni* a synonym 16
ebeni "Green" Leonardi=*Aonidia crenulata* Green 16
echinata in catalogue of Coccidæ 16
javanensis in catalogue of Coccidæ 16
pulchra in catalogue of Coccidæ 16
pusilla in catalogue of Coccidæ 16
Aonidomytilus in catalogue of Coccidæ 16
Aphelininæ, economic importance as parasites of scale insects 69
new genera and species, with a revised table of genera 69–88
preponderance of females over males 71
probable origin of species in United States 71
species described since publication of Technical Series No. 1 69
table of tribes 71

Page.
Aphelinini, characters in table ... 71
table of genera, females ... 71–72
Aphelinus, characters in table ... 72
fuscipennis, parasite of San Jose scale, effectiveness ... 69
mytilaspidis possibly a native species ... 71
simplex, reference to original description, host ... 70
Aphides, *Tabanus stygius* feeding on honeydew therefrom ... 28
Aphididæ, biological studies on three species ... 123–168
Aphidius flavicoxa, parasite of *Aphis maidis* ... 153
Aphis, corn leaf. (See *Aphis maidis*.)
root. (See *Aphis maidi-radicis*.)
maidi-radicis ... 123–144
bibliography ... 137–144
descriptions ... 134–137
distribution ... 124
eggs, description ... 137
female, oviparous, adult wingless, description ... 136
viviparous, adult winged, description ... 135
wingless, description ... 135
food plants ... 124
general account ... 123–124
generations, periods and succession ... 125–128
life history ... 124–134
male, adult wingless, description ... 136–137
after third molt, description ... 136
oviparous generation ... 132–134
descriptions ... 136–137
viviparous generation ... 129–132
descriptions ... 134–135
maidis ... 144–156
bibliography ... 151–156
descriptions ... 149–151
distribution ... 145
food plants ... 145–146
enemies ... 152, 153
female, adult winged, description ... 150–151
wingless, description ... 150
general account ... 144–145
generations, periods and succession ... 147–149
life history ... 146–149
pupa of winged female, description ... 151
viviparous generation, descriptions ... 149–151
sorghum. (See *Sipha flava*.)
sp. on *Phragmites* ... 26
Apple, food plant of *Euthrips pyri* ... 54, 67
Apricot, food plant of *Euthrips pyri* ... 54, 67
Trichothrips dens ... 61, 68
tree, *Æolothrips kuwanaii robustus* taken thereon ... 48, 67
Archenomus, characters in table ... 72
reference to original description ... 70
bicolor, reference to original description, host ... 70
Archytas spp., uterine maggots ... 115
Arctorthezia in catalogue of Coccidæ ... 2

Page.

Arctostaphylos tomentosa (*see also* Manzanita).
food plant of *Euthrips tritici* 40
Artas, characters in table 72
new genus, description 85
koebelei new species, description 85, 86
Artemisia californica, food plant of *Euthrips tritici* 40
Artocarpus integrifolia, *Chionaspis subcorticalis* found under bark 11
food plant of *Saissetia psidii* 10
Arundinaria sp., food plant of *Coccus arundinariæ* 8
Aschersonia aleyrodis or similar species, fungous enemy of *Aleyrodes lactea* 90
Asimina triloba, food plant of *Eulecanium folsomi* 9
Aspidiotiphagus, characters in table 72
Aspidiotus californicus in catalogue of Coccidæ 13
capensis in catalogue of Coccidæ 13
capsulatus in catalogue of Coccidæ 13
coniferarum shastæ in catalogue of Coccidæ 13
cuculus in catalogue of Coccidæ 13
ehrhorni in catalogue of Coccidæ 13
florenciæ in catalogue of Coccidæ 13
hederæ, host of *Azotus marchali* 70, 75
immaculatus in catalogue of Coccidæ 13
moreirai in catalogue of Coccidæ 14
nerii=*Aspidiotus hederæ* 70, 75
ohioensis in catalogue of Coccidæ 14
oxycoccus in catalogue of Coccidæ 14
piceus in catalogue of Coccidæ 14
pisai in catalogue of Coccidæ 14
pseudospinosus in catalogue of Coccidæ 14
pustulans in catalogue of Coccidæ 14
riversæ in catalogue of Coccidæ 14
sp., host of *Bardylis australiensis* 85
Perissopterus noumeænsis 87
subfervens in catalogue of Coccidæ 14
subrubescens corticoides in catalogue of Coccidæ 14
tayabanus in catalogue of Coccidæ 15
(*Aonidiella*) *taprobanus*=*Chrysomphalus taprobanus* 15
(*Chrysomphalus*) *cistuloides*=*Chrysomphalus cistuloides* 15
malleolus=*Chrysomphalus malleolus* 15
pedronis=*Chrysomphalus pedronis* 15
quadriclavatus=*Chrysomphalus quadriclavatus* 15
(*Cryptophyllaspis*) *occultus* var. *elongatus*=*Cryptophyllaspis occultus elongatus* 15
(*Pseudaonidia*) *curculiginis*=*Pseudaonidia curculiginis* 15
(*Targionia*) *phyllanthi*=*Targionia phyllanthi* 16
Asplenium cuneatum, food plant of *Aleyrodes filicium* 93
lucidum, food plant of *Aleyrodes aspleni* 94
Aster, food plant of *Aphis maidi-radicis* 124
Asterolecanium aureum, host of *Perissopterus buscki* 88
delicatum, host of *Encarsia planchoniæ* 70
greeni in catalogue of Coccidæ 3
pustulans sambuci in catalogue of Coccidæ 3
rehi in catalogue of Coccidæ 3
sp., host of *Azotus capensis* 76

Page.
Atalantia zeylanica, food plant of *Parlatoria atalantiæ* ... 18
Avocado (see also *Persea*).
food plant of *Paraleyrodes perseæ* ... 173
Azaleas, food plants of *Heliothrips hæmorrhoidalis* ... 40, 52, 67
Azotus, characters in table ... 72
description ... 74–75
reference to original description ... 70
capensis, new species, description ... 75–76
marchali, hosts ... 70
reference to original description ... 70, 75
pulchriceps=*Ablerus pulchriceps* ... 70
Bamboo, Aleyrodidæ infesting it ... 94
(*Gigantochloa aspera*), food plant of *Odonaspis penicillata* ... 16
Bambusaspis in catalogue of Coccidæ ... 3
Bardylis, characters in table ... 72
new genus, description ... 84
australiensis, new species, description ... 84–85
Barley, food plant of *Aphis maidis* ... 145
Basilarchia, alternate host of introduced Tachinidæ ... 112
Begonia, food plant of *Coccus signiferus* ... 8
Betel, Aleyrodidæ infesting it ... 94
Birds, enemies of *Tabanus sulcifrons* ... 26
Blackberry (see also *Rubus*).
food plant of *Aleyrodes* sp ... 78
wild. (See *Rubus cuneifolius*.)
Bleaching puparia of Tachinidæ ... 115
Blepharipa scutellata, eggs, uterine ... 109
importance as parasite of gipsy moth (*Porthetria dispar*) ... 118
life-history notes ... 99, 101
parasite of *Porthetria dispar* ... 95
reproductive capacity ... 110
habits ... 117
Blepharipeza leucophrys, eggs, uterine ... 116
Bombyliomyia abrupta, maggots, uterine ... 115
Brassica nigra, food plant of *Aphis maidi-radicis* ... 124
Broom corn, food plant of *Aphis maidi-radicis* ... 124
maidis ... 145
Sipha flava ... 157
Bupleurum gibraltaricum, food plant of *Phenacaspis bupleuri* ... 12
Burning against *Aleyrodes longicornis* and *Aleyrodes lactea* ... 90
Cabbage, Aleyrodidæ infesting it ... 93
wild, food plant of *Aleyrodes brassicæ* in Europe ... 93
Cacao, cultivated, food plant of *Pseudococcus tayabanus* ... 5
"Cadena de amor," food plant of *Pulvinaria tyleri* ... 7
Cages for rearing Tachinidæ ... 96–97, 110–111, 113–115
Cales, characters in table ... 72
new genus, description ... 82
noacki, new species, description ... 82
Caliothrips woodworthi=*Heliothrips fasciatus* ... 39, 42
Callistemon salignus, food plant of *Aonidia pulchra* ... 16
Chionaspis candida ... 10
Calophyllum sp., food plant of *Coccus bicruciatus* ... 8
frontalis ... 8

Page.
Calophyllum sp., food plant of *Paralecanium calophylli* 9
Calymnatus incisus=*Coccus incisus* 8
"Campopot," food plant of *Aspidiotus tayabanus* 15
Cannibalism in *Tabanus lasiophthalmus* 20
vivax 33
Capparis moonii, food plant of *Coccus capparidis* 8
Carbolic acid, pine tar, and kerosene against autumn horsefly (*Tabanus sulcifrons*) 27
Carcelia gnava, parasite of *Euproctis chrysorrhœa* and *Porthetria dispar*, egg 105
(?) from Japan, parasite of *Porthetria dispar* 107
Carissa spinarum, food plant of *Aonidia pusilla* 16
Carynota urens, food plant of *Coccus signiferus* 8
Casca, characters in table 72
new genus, description 83
chinensis, new species, description 83–84
Cassinia aculeata, food plant of *Lepidosaphes cassiniæ* 17
Castilloa sp., food plant of *Pseudococcus crotonis* 5
Catfish. (See *Amiurus melas*.)
Cattle (*see also* Stock, live).
hosts of *Tabanus stygius* 28
Ceanothus thyrsiflorus. (*See* Lilac, California.)
Centrodora, characters in table 72
Ceratonia siliqua, food plant of *Phenacaspis ceratoniæ* 12
Ceroplastes actiniformis, host of *Coccophagus orientalis* 70
sanguineus in catalogue of Coccidæ 7
schrottkyi in catalogue of Coccidæ 7
sp., host of *Ancristus ceroplastæ* 70
Chaitophorus flava=*Sipha flava* 156
Chalcidid fly, yellow, parasite of *Aleyrodes alcocki* 94
Cherries, food plants of *Euthrips pyri* 54, 67
Cherry laurel, food plant of *Heliothrips hæmorrhoidalis* 40
Chickens, enemies of *Sipha flava* 167
Chionaspis angustata in catalogue of Coccidæ 10
candida in catalogue of Coccidæ 10
cinnamomi in catalogue of Coccidæ 10
coronifera in catalogue of Coccidæ 11
decurvata in catalogue of Coccidæ 11
formosa in catalogue of Coccidæ 11
gleditsiæ in catalogue of Coccidæ 11
madiunensis, host of *Physcus flavidus* 70
ortholobis bruneri=*Chionaspis salicis-nigræ* 11
in catalogue of Coccidæ 11
sacchari-folii, host of *Aphelinus simplex* 70
salicis-nigræ, *Chionaspis ortholobis bruneri* a synonym 11
strobilanthi=*Phenacaspis strobilanthi* 12
subcorticalis in catalogue of Coccidæ 11
sylvatica in catalogue of Coccidæ 11
vitis, host of *Artas koebelei* 86
Christmas berry. (See *Heteromeles arbutifolia*.)
Chrysomphalus cistuloides in catalogue of Coccidæ 15
malleolus in catalogue of Coccidæ 15
pedronis in catalogue of Coccidæ 15
quadriclavatus in catalogue of Coccidæ 15

Page.
Chrysomphalus taprobanus in catalogue of Coccidæ 15
Chrysops mœrens, habits and life history 36–38
Chusquea, food plant of *Aspidiotus riverœ* 14
Cinnamomum, food plant of *Chionaspis cinnamomi* 10
Chrysomphalus cistuloides 15
Citrus, food plants of *Aleyrodes nubifera* 173
aurantium (*see also* Orange).
food plant of *Aleyrodes eugeniæ* var. *aurantii* 174
in greenhouses, food plants of *Aleyrodes citri* 94
sp., food plant of *Aleyrodes spinifer* 91
Coccidæ, catalogue of those recently described 1–18
National collection, scope and arrangement 1
Coccinæ in catalogue of Coccidæ 6–10
Coccomytilus hymenantheræ. (See *Lepidosaphes hymenantheræ*.)
Coccophagus, characters in table 72
reference to original description 80
flavescens, reference to original description, host 70
fletcheri, reference to original description, host 70
lecanii possibly a native species 71
longifasciatus, new species, description 80–81
orientalis, reference to original description, hosts 70
subochraceus, new species, description 80
zebratus, new species, description 81
Coccus arundinariæ in catalogue of Coccidæ 8
bicruciatus in catalogue of Coccidæ 8
capparidis in catalogue of Coccidæ 8
diversipes in catalogue of Coccidæ 8
frontalis in catalogue of Coccidæ 8
incisus in catalogue of Coccidæ 8
marsupialis in catalogue of Coccidæ 8
signiferus in catalogue of Coccidæ 8
viridis, host of *Coccophagus orientalis* 70
Cocoanut, Aleyrodidæ infesting it 92
Cocoa palm, food plant of *Aspidiotus* sp 87
Coffea arabica, food plant of *Lepidosaphes corrugata* 17
Colonization of Tachinidæ, improvement in method 111
Compsilura concinnata, eggs, uterine 108
importance as parasite of *Euproctis chrysorrhœa* 118
life-history notes 102
maggots, uterine 108
parasite of *Euproctis chrysorrhœa* 102
Hemerocampa leucostigma 112
reproductive habits 117
(?) from Japan, parasite of *Porthetria dispar* 107
Conchaspinæ in catalogue of Coccidæ 3
Conchaspis fluminensis in catalogue of Coccidæ 3
Copecrypta (*Trichophora*) *ruficauda*, maggots, uterine 115
Copulation in *Tabanus sulcifrons* 24
Cordea lutea, food plant of *Orthezia galapogoensis* 3
curassavica, food plant of *Diaspis cordiæ* 11
Corn, food plant of *Aphis maidi-radicis* 124
maidis 145
Sipha flava 157

Page.
Corydalis cornuta, location of larvæ..... 33
Cotton (see also *Gossypium*).
Aleyrodidæ infesting it..... 92
Crab apple, wild, food plant of *Aleyrodes pergandei*..... 94
Cranberry (*Oxycoccus*), food plant of *Aspidiotus oxycoccus*..... 14
Cratægus, food plant of *Aleyrodes pergandei*..... 94
Cremastogaster dohrni, association with *Saissetia discrepans*..... 9
Crossocosmia sericariæ, parasite of silkworm, habits..... 99, 110, 116
reproductive capacity..... 110
sp., from Japan, habits, parasite of *Porthetria dispar*..... 107
importance as parasite of *Porthetria dispar*..... 118
Croton, cultivated, food plant of *Pseudococcus virgatus*..... 5
Crustacea, small, food of *Tabanus lasiophthalmus*..... 20
vivax..... 33
Cryptoparlatorea in catalogue of Coccidæ..... 18
leucaspis in catalogue of Coccidæ..... 18
Cryptophyllaspis bornmülleri in catalogue of Coccidæ..... 15
occultus elongatus in catalogue of Coccidæ..... 15
Cryptothrips, characters in table..... 43
californicus, description..... 66–67
in table..... 45
under old shells of *Lecanium armeniacum* and *Saissetia oleæ*..... 41
Ctenochiton serratus in catalogue of Coccidæ..... 7
Cucumbers, food plants of *Aleyrodes vaporariorum*..... 93
Cucumber tree. (See *Magnolia acuminata*.)
Cupressus goveniana, food plant of *Leucaspis cupressi*..... 12
Pseudococcus andersoni..... 5
macnabiana, food plant of *Aspidiotus coniferarum shastæ*..... 13
Pseudococcus dudleyi..... 5
Curculigo recurvata, food plant of *Pseudaonidia curculiginis*..... 15
Currant, Aleyrodidæ infesting it..... 94
Custard apple (see also *Anona*).
Aleyrodidæ infesting it..... 93
Cyperus rotundatus, food plant of *Antonina australis*..... 5
Dactylopiinæ in catalogue of Coccidæ..... 3–5
Dactylopius adonidum=Pseudococcus longispinus..... 70
andersoni=Pseudococcus andersoni..... 5
crotonis=Pseudococcus crotonis..... 5
dudleyi=Pseudococcus dudleyi..... 5
elongatus=Pseudococcus elongatus..... 5
vagabundus=Pseudococcus vagabundus..... 5
Dahlias, food plants of *Heliothrips hæmorrhoidalis*..... 52, 67
Datana, alternate host of introduced Tachinidæ..... 112
Davis, John June, paper, "Biological Studies on Three Species of Aphididæ". 123–168
Dexodes nigripes, eggs, uterine..... 108
importance as parasite of *Euproctis chrysorrhœa*..... 118
life-history notes..... 102
maggots, uterine..... 108
parasite of *Euproctis chrysorrhœa*..... 102
Hemerocampa leucostigma..... 112
Porthetria dispar..... 102

Page.
Diacrisia virginica, experiment in parasitization by *Pales pavida*..... 100
Diaspidiotus ehrhorni. (See *Aspidiotus ehrhorni*.)
ohioensis. (See *Aspidiotus ohioensis*.)
Diaspinæ in catalogue of Coccidæ..... 10–18
Diaspis cordiæ in catalogue of Coccidæ..... 11
Diaspis ostreæformis=Epidiaspis piricola..... 70, 75
pentagona, host of *Prospalta berlesei*..... 70
sp., on *Acacia horrida*, host of *Encarsia diaspidis*..... 77
squamosus in catalogue of Coccidæ..... 11
Dobson fly. (See *Corydalis cornuta*.)
Dock. (See *Rumex crispus* and *Rumex altissimus*.)
Dracæna, food plant of *Parthenothrips dracænæ*..... 57, 67
Drymus sp., food plant of *Aspidiotus moreirai*..... 14
pisai..... 14
Earfly, marsh. (See *Chrysops mœrens*.)
Echinomyia algens, maggots, uterine..... 115
grossa, larviparous habits..... 101
Eleagnus latifolia, food plant of *Coccus bicruciatus*..... 8
Encarsia, characters in table..... 72
table of species..... 76–77
angelica, characters in table..... 76
aonidiæ, characters in table..... 77
reference to original description, host..... 70
coquillettii, characters in table..... 77
diaspidis, characters in table..... 77
new species, description..... 77
flaviclava, characters in table..... 76
reference to original description..... 70
luteola, characters in table..... 76
pergandiella, characters in table..... 76
new species, description..... 78
planchoniæ, characters in table..... 76
reference to original description, host..... 70
portoricensis, characters in table..... 76
new species, description..... 77–78
quaintancei, characters in table..... 76
new species, description..... 79
townsendi, characters in table..... 77
new species, description..... 78–79
variegata, parasite of *Paraleyrodes persicæ*..... 173
Epidiaspis piricola, host of *Archenomus bicolor*..... 70
Azotus marchali..... 70, 75
Eretmocerus, characters in table..... 72
cornii, possibly a native species..... 71
Erigeron canadense, food plant of *Aphis maidi-radicis*..... 124
Eriococcus simplex dealbata=Eriococcus tricarinatus..... 4
sordidus in catalogue of Coccidæ..... 3
tricarinatus in catalogue of Coccidæ..... 4
Eriopeltis coloradensis in catalogue of Coccidæ..... 7
Erythrina lithosperma, food plant of *Aspidiotus pustulans*..... 14
"*Lecanium*" *tenebricophilum*..... 10
Pulvinaria maxima..... 6
Eucalymnatus subtessellatus in catalogue of Coccidæ..... 7

Page.
Eucalyptus globosus, food plant of *Aspidiotus subrubescens corticoides* 14
globulus, food plant of *Lepidosaphes bicornis* 17
gomphocephala, food plant of *Eriococcus tricarinatus* 4
goniocalyx, food plant of *Sphærococcus pustulans* 4
tereticornis, food plant of *Chionaspis formosa* 11
Eugenia malaccensis, food plant of *Lepidosaphes rubrovittatus* 17
sp., food plant of *Coccus bicruciatus* 8
Saissetia psidii 10
Eulecanium curtisi in catalogue of Coccidæ 8
fletcheri, host of *Coccophagus fletcheri* 70
folsomi in catalogue of Coccidæ 9
lüstneri in catalogue of Coccidæ 9
pulchrum in catalogue of Coccidæ 9
sp., honeydew eaten by *Tabanus sulcifrons* 26
Euleucaspis corsa. (See *Leucaspis corsa.*)
Euparlatoria in catalogue of Coccidæ 18
Eupeleteria magnicornis, eggs, uterine 108
life-history notes 103–105
maggots, uterine 108
parasite of *Euproctis chrysorrhœa* 104
Hyphantria cunea 112
reproductive capacity 109–110
habits 117
Euphorbia hypericifolia, food plant of *Ceroplastes* sp 70
intisy, food plant of *Amelococcus alluaudi* 4
Euproctis chrysorrhœa, host of *Carcelia gnava* 105
Compsilura concinnata 102
Dexodes nigripes 102
Eupeleteria magnicornis 104
Masicera (?) 101
Parexorista cheloniæ 95, 97–98
Phorocera (?) 101
Tachina clisiocampæ 106
Tachinas, European 112
Japanese 111, 113
Zygobothria nidicola 105
most important tachinid parasites 118
Euryops tenuissimus, food plant of *Asterolecanium* sp 76
Eusisyropa, two species near it, uterine eggs 116
blanda, eggs, uterine 116
Euthrips, characters in table 42
description 52
citri. (*See* Thrips, orange.)
ehrhorni, characters in table 44
food plant 55, 67
new species, description 54, 55
minutus, characters in table 44
food plant 57, 67
new species, description 56–57
occidentalis, characters in table 44
food plants 67
orchidii, characters in table 43
food plants 53–67

Page.
Euthrips orchidii, new species, description 52–53
pyri, characters in table 43
description 53–54
economic importance 41
food plants 54, 67
tritici, characters in table 44
food plants 67
injury to oranges 40
ulicis californicus, characters in table 44
food plant 56, 67
new variety, description 55–56
Euvanessa, alternate host of introduced Tachinidæ 112
antiopa, experiments in parasitization by *Zenillia libatrix* 100
Evaspidiotus subrubescens var. *corticoides*. (See *Aspidiotus subrubescens corticoides*.)
Exorista, eggs, uterine 116
Fagreæ, food plants of *Saissetia psidii* 10
Fernaldiella in catalogue of Coccidæ 16
Fern "parasite," *Coccus diversipes* taken thereon 8
Ferns, Aleyrodidæ infesting them 93–94
food plants of *Heliothrips hæmorrhoidalis* 52, 67
Ficus (*see also* Fig).
bengalensis, food plant of *Tachardia fici* 6
carica, food plant of *Lepidosaphes ficifolii* 17
cultivated, food plant of *Pulvinaria psidii philippina* 7
indica, food plant of *Aleyrodes alcocki* 94
religiosa, food plant of *Aleyrodes alcocki* 94
Tachardia fici 6
Fig (see also *Ficus*).
Aleyrodidæ infesting it 94
food plant of *Euthrips bremneri* 60, 68
pyri 54, 67
Fiorinia bidens in catalogue of Coccidæ 13
Fleabane. (See *Erigeron canadense*.)
Formica fusca, association with *Aphis maidi-radicis* 139
schaufussi, association with *Aphis maidi-radicis* 139
Fungous enemy of *Euthrips pyri* 41
Garcinia spicata, food plant of *Paralecanium zonatum* 9
Gardenia, food plant of *Aleyrodes citri* 174
nubifera 173
Geranium, food plant of *Aleyrodes rolfsii* 94
Gigantochloa aspera, food plant of *Odonaspis penicillata* 16
Gleditsia triacanthos, food plant of *Chionaspis gleditsiæ* 11
Globularia salicina, food plant of *Asterolecanium rehi* 3
Cryptophyllaspis bornmülleri 15
Gonia frontosa, eggs, uterine 116
Gossypium (*see also* Cotton).
religiosum, food plant of *Aleyrodes gossypii* 92
sp., food plant of *Hemichionaspis townsendi* 12
Gramineæ, food plants of *Sipha* spp 157
Grape, Aleyrodidæ infesting it 94
food plant of *Euthrips pyri* 54, 67
Grapefruit, food plant of *Tachardia aurantiaca* 6

Page.
Grass, food plant of *Acanthothrips doaneii* ... 65, 68
Aphis maidi-radicis ... 124
Eriopeltis coloradensis ... 7
Euthrips ehrhornii ... 55, 67
minutus ... 57, 67
Sericothrips apteris ... 50, 67
reticulatus ... 51, 67
stanfordii ... 51, 67
Trionymus nanus ... 5
coarse, food plant of *Aleyrodes* sp. ... 79
crab. (See *Panicum.*)
Grasses. (See Gramineæ and Juncaceæ.)
Greenhouse plants, Aleyrodidæ infesting them ... 93–94
Greeniella pulchra. (See *Aonidia pulchra.*)
Grewia sp., food plant of *Cryptophyllaspis occultus elongatus* ... 15
Guava (see also *Psidium*).
Aleyrodidæ infesting it ... 92
food plant of *Aleyrodes floridensis* ... 90
Gutierrezia glomerella, food plant of *Tachardia glomerella* ... 6
Gymnaspis spinomarginata in catalogue of Coccidæ ... 76
Hakea sp., food plant of *Aspidiotus* sp. ... 85
Handpicking against marsh ear fly (*Chrysops mœrens*) ... 37–38
Helichrysum ferrugineum, food plant of *Eriococcus sordidus* ... 3
Heliothrips, characters in table ... 42
fasciatus, *Caliothrips woodworthi* a synonym ... 39, 42
characters in table ... 43
food plants ... 52, 67
hæmorrhoidalis, characters in table ... 43
feeding injuries ... 40
food plants ... 52, 67
Heliotrope, food plant of *Aleyrodes vaporariorum* ... 93
Hemerocampa leucostigma, alternate host of *Dexodes nigripes*, *Compsilura concinnata*, *Tricholyga grandis*, et al ... 112
host of *Dexodes nigripes* ... 102
Hemiberlesia immaculatus. (See *Aspidiotus immaculatus.*)
Hemichionaspis theæ ceylonica in catalogue of Coccidæ ... 12
townsendi in catalogue of Coccidæ ... 12
Hemicyclia sepiaria, food plant of *Aonidia echinata* ... 16
Hemimasicera sp. (?) egg, deposition ... 106
eggs, uterine ... 108
parasite of *Porthetria dispar* ... 107
Heteromeles arbutifolia, food plant of *Trichothrips ilex* ... 40–41, 63, 68
Hine, James S., paper, "Habits and Life Histories of some Flies of the Family Tabanidæ" ... 19–38
Hippodamia convergens, enemy of *Aphis maidis* ... 152
glacialis, enemy of *Aphis maidis* ... 152
maculata, enemy of *Aphis maidis* ... 152
Hemyda aurata, eggs, ovarian ... 117
Honeydew of aphides, food of *Tabanus stygius* ... 28
Hornet, bald-faced. (See *Vespa maculata.*)
Horsefly, autumn. (See *Tabanus sulcifrons.*)
black. (See *Tabanus atratus.*)
and white. (See *Tabanus stygius.*)

Page.
Horsefly, black-striped. (See *Tabanus lasiophthalmus*.)
river. (See *Tabanus rivax*.)
Horseflies. (See Tabanidæ.)
Horses (*see also* Stock).
hosts of *Tabanus stygius* ... 28
Host larviposition, subcutaneous, in *Compsilura concinnata* ... 117
supracutaneous, in dexiine flies and allies ... 117
oviposition in *Tachina larvarum* ... 117
Howardia lobulata=*Rhopaloaspis ricca* ... 11
in catalogue of Coccidæ ... 11
Howard, L. O., paper, "New Genera and Species of Aphelininæ, with a Revised Table of Genera" ... 69–88
Hymenanthera banksii, food plant of *Lepidosaphes hymenantheræ* ... 17
Icerya candida in catalogue of Coccidæ ... 2
colimensis in catalogue of Coccidæ ... 2
littoralis tonilensis in catalogue of Coccidæ ... 2
rileyi larreæ in catalogue of Coccidæ ... 2
Indigo, Aleyrodidæ infesting it ... 94
Indigofera arrecta, food plant of *Aleyrodes leakii* ... 94
tinctoria, food plant of *Aleyrodes leakii* ... 94
Iridomyrmex humilis, association with *Pulvinaria grabhami* ... 6
Jossinia tinifolia, food plant of *Pulvinaria grabhami* ... 6
Juncaceæ, food plants of *Sipha* spp ... 157
Juniperus sp., food plant of *Cryptoparlatorea leucaspis* ... 18
Kale, food plant of *Aleyrodes brassicæ* ... 93
Kerosene against marsh earfly (*Chrysops marens*) ... 38
carbolic acid, and pine tar against autumn horsefly (*Tabanus sulcifrons*) ... 27
"Kina." (See *Calophyllum* sp.)
Knotweed. (See *Polygonum persicaria*.)
Lantana, food plant of *Aleyrodes vaporariorum* ... 93
Larrea, food plant of *Icerya rileyi larreæ* ... 2
Larviposition in certain Tachinidæ ... 101–102
Lasius flavus, association with *Aphis maidi-radicis* ... 139
niger, occurrence with *Phenacoccus ripersioides* ... 4
var. *americanus*, association with *Aphis maidi-radicis* ... 125
sp., *Orthezia olivacea* in nests ... 3
Latreillimyia sp., eggs, uterine ... 116
Laurel, California, food plant of *Thrips madronii* ... 58, 67
Laurestina, food plant of *Heliothrips hæmorrhoidalis* ... 40, 52, 67
Leaf larviposition in *Eupeleteria magnicornis* ... 103–105, 117
Tachinidæ ... 117
oviposition in *Blepharipa scutellata* ... 117
certain Tachinidæ ... 99–101, 117
Crossocosmia sp., from Japan ... 107
Lecanium armeniacum, *Cryptothrips californicus* under old scales ... 41, 67, 68
arundinariæ=*Coccus arundinariæ* ... 8
bicruciatum=*Coccus bicruciatus* ... 8
capparidis=*Coccus capparidis* ... 8
coffeæ=*Saissetia hemisphærica* ... 70
discrepans=*Saissetia discrepans* ... 9
expansum var. *javanicum*=*Paralecanium expansum javanicum* ... 9
metallicum=*Paralecanium expansum metallicum* ... 9

Page.
Lecanium expansum var. *quadratum=Paralecanium expansum quadratum* 9
rotundum=Paralecanium expansum rotundum 9
frontale=Coccus frontalis 8
lüstneri=Eulecanium lüstneri 9
marsupiale=Coccus marsupialis 8
nigrum=Saissetia nigra 81
oleæ=Saissetia oleæ 69
psidii=Saissetia psidii 10
pulchrum=Eulecanium pulchrum 9
punctuliferum=Saissetia punctulifera 10
signiferum=Coccus signiferus 8
sp., host of *Coccophagus subochraceus* 80
subtessellatum=Eucalymnatus subtessellatus 7
viride=Coccus viridis 70
zonatum=Paralecanium zonatum 9
(*Paralecanium*) *calophylli=Paralecanium calophylli* 9
peradeniyense=Paralecanium peradeniyense 9
"*Lecanium*" *insolens* in catalogue of Coccidæ 10
limnanthemi in catalogue of Coccidæ 10
tenebricophilum in catalogue of Coccidæ 10
Lemon, food plant of *Aleyrodes citri* 174
Lepidosaphes alba, Lepidosaphes cockerelliana a synonym 16
beckii, host of *Casca chinensis* 84
Prospalta maculata 80
bicornis in catalogue of Coccidæ 17
cassiniæ in catalogue of Coccidæ 17
cockerelliana=Lepidosaphes alba 16
in catalogue of Coccidæ 16
corrugata in catalogue of Coccidæ 17
ficifolii in catalogue of Coccidæ 17
hymenantheræ in catalogue of Coccidæ 17
intermedia victoriæ in catalogue of Coccidæ 17
multipora in catalogue of Coccidæ 17
pallens, host of *Perissopterus capillatus* 87
rubrovittatus in catalogue of Coccidæ 17
ungulata in catalogue of Coccidæ 17
wilga in catalogue of Coccidæ 17
Leptospermum lævigatum, food plant of *Chionaspis angustata* 10
Leucaspis corsa in catalogue of Coccidæ 12
cupressi in catalogue of Coccidæ 12
japonica, host of *Marlattiella prima* 73
kelloggi in catalogue of Coccidæ 12
kermanensis in catalogue of Coccidæ 12
leonardi in catalogue of Coccidæ 12
pini=Leucaspis leonardi 12
riccæ, Rhopaloaspis riccæ a synonym 13
Leucospermum attenuatum, food plant of *Lecanium* sp. 80
Libocedrus decurrens, food plant of *Aspidiotus ehrhorni* 13
Pseudococcus andersoni 5
Lichen on *Picea breweriana, Phenacoccus kuwanæ* taken thereon 4
Lichens on *Abies concolor, Aspidiotus ehrhorni* taken thereon 13
Lilac, food plant of *Euthrips tritici* 40
California, food plant of *Æolothrips kuwanaii* 41, 48, 67

Page.
Lilac, California, food plant of *Thrips madronii*... 58, 67
Lime, milk, against *Aleyrodes longicornis* and *Aleyrodes lactea*... 90
Limnanthemum nymphoides, food plant of "*Lecanium*" *limnanthemi*... 10
Liriodendron tulipifera, food plant of *Aspidiotus piceus*... 14
Madroña, food plant of *Orothrips kelloggii*... 41, 46, 67
Thrips madronii... 58, 67
Magnolia acuminata, food plant of *Eulecanium*... 26
Mangifera indica, food plant of *Saissetia psidii*... 10
Mango, food plant of *Monophlebus stebbingii mangiferæ*... 2
Manzanita (see also *Arctostaphylos tomentosa*).
food plant of *Orothrips kelloggii*... 41, 46, 67
Margarodinæ in catalogue of Coccidæ... 2
Marietta, characters in table... 72
Marlattiella, characters in table... 71
new genus, description... 73
prima, new species, description... 73
Masicera (?), maggots, uterine... 117
parasite of *Euproctis chrysorrhœa*... 101
two species, eggs, uterine... 116
Maskellia globosa, galls, *Eriococcus tricarinatus* taken thereon... 4
Maytenus sp., food plant of *Ceroplastes sanguineus*... 7
Megalothrips, characters in table... 43
not hitherto recorded from America... 39
hesperus in table... 45
new species, description... 65–66
Melalopha, alternate host of introduced Tachinidæ... 112
inclusa, experiment in parasitization by *Zenillia libatrix*... 100
Melons, food plants of *Aleyrodes vaporariorum*... 93
Memecyclon umbellatum, food plant of *Coccus bicruciatus*... 8
Mesidia, characters in table... 72
description... 73–74
mexicana, new species, description... 74
Mesograpta polita found in association with *Aphis maidis*... 152
Mesolecanium inflatum in catalogue of Coccidæ... 8
Mesua ferrea, food plant of *Gymnaspis spinomarginata*... 16
Michelia champaca, food plant of *Saissetia punctulifera*... 10
Micropalpus sp., maggots, uterine... 115
Microphthalma trifasciata, reproductive capacity... 110
Miltogramma conica, larviparous habits... 101
Mimosicerya in catalogue of Coccidæ... 2
Mimusops hexandra, food plant of *Chrysomphalus malleolus*... 15
Monophlebinæ in catalogue of Coccidæ... 2
Monophlebulus townsendi in catalogue of Coccidæ... 2
Monophlebus stebbingii mangiferæ in catalogue of Coccidæ... 2
Moulton, Dudley, paper, "A Contribution to our Knowledge of the Thysanoptera of California"... 39–68
"The Orange Thrips"... 119–122
Mullein, wild, food plant of *Trichothrips femoralis*... 62, 68
Murraya exotica, food plant of *Chrysomphalus quadriclavatus*... 15
Mustard. (See *Brassica nigra*.)
Myiocnema, characters in table... 72
reference to original description... 69
pallida, reference to original description, host... 69

Page.
Myristica fragrans, food plant of *Aonidia javanensis* 16
Paralecanium expansum metallicum 9
moschata, food plant of *Saissetia psidii* 10
Myrtaceæ, food plants of *Mesolecanium inflatum* 8
Mytilaspis bicornis=Lepidosaphes bicornis 17
cassiniæ=Lepidosaphes cassiniæ 17
citricola=Lepidosaphes beckii 80, 84
ficifolii=Lepidosaphes ficifolii 17
intermedia var. *victoriæ=Lepidosaphes intermedia victoriæ* 17
multipora=Lepsidosaphes multipora 17
pallens=Lepidosaphes pallens 87
wilga=Lepidosaphes wilga 17
(*Coccomytilus*) *hymenantheræ=Lepidosaphes hymenantheræ* 17
Mytilella in catalogue of Coccidæ 16
Myzus achyrantes, generations, number produced experimentally 128
Nephrolepis, food plant of *Aleyrodes nephrolepidis* 93
Nothopegia colebrookiana, food plant of *Coccus bicruciatus* 8
Nutmeg, food plant of *Coccus incisus* 8
Paralecanium expansum quadratum 9
Nyssa sylvatica, food plant of *Chionaspis sylvatica* 11
Oak, scrub. (See *Quercus dumosa*.)
Odonaspis penicillata in catalogue of Coccidæ 16
Œcophylla smaragdina, association with *Saissetia psidii* 10
Oleander articulata, food plant of *Aleyrodes filicium* 94
Onion, food plant of *Thrips tabaci* 41, 59, 68
Opuntiaspis javanensis in catalogue of Coccidæ 18
Orange (see also *Citrus aurantium*).
Aleyrodidæ infesting it 90
food plant of *Aleyrodes citri* 174
nubifera 173
Heliothrips fasciatus 52, 67
orange thrips (*Euthrips citri*) 119–122
Paraleyrodes persææ 173
Pseudococcus lilacinus 5
Oranges, injury by *Euthrips tritici* 40
Orchids, food plants of *Euthrips orchidii* 53, 67
(*Vanda hookeriana* and *Vanda teres*), food plants of *Parlatoria pseudaspidiotus* 18
Orothrips, characters in table 42
new genus, description 45
kelloggii, food plants 46, 67
in blossoms of manzanita and madroña 41
table 43
new species, description 45–46
Orthezia galapagœnsis in catalogue of Coccidæ 3
olivacea in catalogue of Coccidæ 3
solidaginis in catalogue of Coccidæ 3
sp., host of *Cales noacki* 82
Ortheziinæ in catalogue of Coccidæ 2
Oryza sativa, food plant of *Chionaspis decurvata* 11
Oxalis, food plant of *Aphis maidis* 145
stricta, food plant of *Aphis maidi-radicis* 124
Oxycoccus. (*See* Cranberry.)

Page.
Pachyneuron maidaphidis, parasite of *Aphis maidis* 153
Pales pavida, eggs, uterine 109
life-history notes 99–100, 101
sp., near *pavida*, habits, parasite of *Porthetria dispar* 107
"Palo de Gusano," food plant of *Aleyrodes* sp 74
Panicum, food plant of *Aphis maidi-radicis* 124
crus-galli, food plant of *Aphis maidis* 145
Sipha flava 157
proliferum, food plant of *Aphis maidis* 145
sanguinale, food plant of *Sipha flava* 157
Panzeria sp., maggots, uterine 115
Parachæta sp., eggs, uterine 116
Paralecanium calophylli in catalogue of Coccidæ 9
expansum javanicum in catalogue of Coccidæ 9
metallicum in catalogue of Coccidæ 9
quadratum in catalogue of Coccidæ 9
rotundum in catalogue of Coccidæ 9
peradeniyense in catalogue of Coccidæ 9
zonatum in catalogue of Coccidæ 9
Paraleyrodes, new genus, description 169–170
perseæ, adult, description 172–173
description, revised 170–173
egg, description 170
food plants 173
host of *Encarsia variegata* 173
larva, first stage, description 170
pupa case, description 170–172
Parasetigena segregata, eggs, uterine 108
life-history notes 105–106
parasite of *Porthetria dispar* 106
Parexorista cheloniæ, eggs, ovarian and uterine 108, 109
importance as parasite of *Euproctis chrysorrhœa* 118
life-history notes 97–99
parasite of *Euproctis chrysorrhœa* 95, 97–98
perhaps larviparous 102
reproductive capacity 109
Parlatoria atalantiæ in catalogue of Coccidæ 18
pergandei phyllanthi in catalogue of Coccidæ 18
pseudaspidiotus in catalogue of Coccidæ 18
Parthenothrips, characters in table 43
dracænæ, food plant 57, 67
in table 44
on *Dracæna* 57
Pawpaw. (See *Asimina triloba*.)
Peach, food plant of *Aleyrodes pergandei* 94
Diaspis squamosus 11
Pear, food plant of *Diaspis squamosus* 11
Euthrips pyri 54, 67
Pea vines, food plants of *Heliothrips fasciatus* 52, 67
Peleteria spp., maggots, uterine 115
Perissopterus, characters in table 72
table of species 86–87
busckii, characters in table 87

Page.
Perissopterus busckii, new species, description 87–88
capillatus, characters in table 86
new species, description 87
javensis, characters in table 87
new species, description 88
mexicanus, characters in table 87
noumeænsis, characters in table 86
new species, description 87
pulchellus, characters in table 87
Persea (*see also* Avocado).
carolinensis, food plant of *Paraleyrodes perseæ* 169, 173
Persimmon (?), food plant of *Paraleyrodes perseæ* 173
Phenacaspis bupleuri in catalogue of Coccidæ 12
ceratoniæ in catalogue of Coccidæ 12
strobilanthi in catalogue of Coccidæ 12
Phenacobryum =*Antecerococcus* 3
in catalogue of Coccidæ 3
Phenacoccus aceris. *Pseudococcus vagabundus* a synonym 5
æsculi. *Pseudococcus vagabundus* a synonym 5
cockerelli in catalogue of Coccidæ 4
kuwanæ in catalogue of Coccidæ 4
mespili=*Phenacoccus pruni* 5
pruni, *Pseudococcus vagabundus* a synonym 5
ripersioides in catalogue of Coccidæ 4
Philodendron, food plant of *Lecanium insolens* 10
Phlœothripidæ, characters in table 42
Phorocera (?) egg, uterine 117
parasite of *Euproctis chrysorrhœa* 101
Phragmites, food plant of an aphis 26
Phyllanthus myrtifolius, food plant of *Chrysomphalus taprobanus* 15
Parlatoria pergandei phyllanthi 18
Targionia phyllanthi 16
Physcus, characters in table 72
flavidus, reference to original description, host 70
Physokermes concolor in catalogue of Coccidæ 10
taxifoliæ in catalogue of Coccidæ 10
Physopus ulicis=*Euthrips ulicis* 56
Picea breweriana, *Phenacoccus kuwanæ* taken on lichen thereon 4
Pigweed. (See *Amaranthus hybridus*.)
Pine tar, carbolic acid, and kerosene against autumn horsefly (*Tabanus sulcifrons*) 27
Pinus attenuata, food plant of *Aspidiotus californicus* 13
lambertiana, food plant of *Aspidiotus californicus* 13
laricis, food plant of *Leucaspis corsa* 12
picea, food plant of *Leucaspis leonardi* 12
ponderosa, food plant of *Aspidiotus californicus* 13
florenciæ 13
sabiniana, food plant of *Aspidiotus californicus* 13
Piper betle. food plant of *Aleyrodes nubilans* 94
nigrum, food plant of *Aspidiotus capsulatus* 13
Coccus marsupialis 8
Paralecanium peradeniyense 9
Pittosporum undulatum, food plant of *Lepidosaphes multipora* 17

Page.
Planchonia delicata=Asterolecanium delicatum 70
Plantago major, food plant of *Aphis maidi-radicis* 124
rugellii, food plant of *Aphis maidi-radicis* 124
Plantain. (See *Plantago major* and *Plantago rugellii*.)
Plastocharis=Thysanus 72
Plum, food plant of *Aleyrodes pergandei* 94
Euthrips pyri 54, 67
Polygonum, food plant of *Aleyrodes* 79
incarnatum, food plant of *Aphis maidi-radicis* 124
pennsylvanicum, food plant of *Aphis maidis* 145
persicaria, food plant of *Aphis maidi-radicis* 124
Polyocellaria in catalogue of Coccidæ 2
Pomaderris sp., food plant of *Aspidiotus subfervens* 14
Populus cuphratica, food plant of *Leucaspis kermanensis* 12
Porthetria dispar, host of *Blepharipa scutellata* 95, 118
Carcelia gnava 105
Carcelia gnava(?) from Japan 107
Compsilura concinnata(?) from Japan 107
Crossocosmia sp 107, 118
Dexodes nigripes 102
Hemimasicera(?) 107
Pales sp., near *pavida* 107
Parasetigena segregata 106
Tachina clisiocampæ 106–107
Tachinas, Japanese 107, 111
Zygobothria gilva 105
Zygobothria gilva(?) from Japan 107
Portulaca oleracea, food plant of *Aphis maidi-radicis* 124
Pothos scandens, food plant of *Coccus marsupialis* 8
Prosopothrips vejdovskyi, resemblance to *Sericothrips reticulatus* 51
Prospalta, characters in table 72
reference to original description 79
berlesei, reference to original description, host 70
maculata, new species, description 79–80
tristis, reference to original description, host 70
Prune, food plant of *Euthrips pyri* 54, 67
Prunus spp., Aleyrodidæ infesting them 94
Pseudaonidia curvuliginis in catalogue of Coccidæ 15
Pseudococcus andersoni in catalogue of Coccidæ 5
crotonis in catalogue of Coccidæ 5
dudleyi in catalogue of Coccidæ 5
elongatus in catalogue of Coccidæ 5
ephedræ in catalogue of Coccidæ 5
lilacinus in catalogue of Coccidæ 5
longispinus, host of *Coccophagus orientalis* 70
tayabanus in catalogue of Coccidæ 5
vagabundus in catalogue of Coccidæ 5
virgatus in catalogue of Coccidæ 5
Pseudogermaria sp., eggs, uterine 116
Pseudotsuga taxifolia, food plant of *Leucaspis kelloggii* 12
Physokermes taxifoliæ 10
Psidium (*see also* Guava).
guava, food plant of *Saissetia psidii* 10

Page.
Pteris quadriolata, food plant of *Aleyrodes filicium* 94
Pteroptricini, characters in table 71
table of genera, females 72
Pteroptrix, characters in table 72
Pulvinaria camellicola, *Pseudococcus vagabundus* a synonym 5
coulteri in catalogue of Coccidæ 6
gœthei in catalogue of Coccidæ 6
grabhami in catalogue of Coccidæ 6
betheli in catalogue of Coccidæ 6
maxima in catalogue of Coccidæ 6
polygonata in catalogue of Coccidæ 6
psidii philippina in catalogue of Coccidæ 7
rehi in catalogue of Coccidæ 7
tyleri in catalogue of Coccidæ 7
vitis opacus in catalogue of Coccidæ 7
sorbusæ in catalogue of Coccidæ 7
verrucosæ in catalogue of Coccidæ 7
Purslane. (See *Portulaca oleracea*.)
Quaintance, A. L., paper, "A New Genus of Aleyrodidæ, with Remarks on *Aleyrodes nubifera* Berger, and *Aleyrodes citri* Riley and Howard" 169–174
"The more Important Aleyrodidæ Infesting Economic Plants with description of a New Species Infesting the Orange" 89–94
Quercus dumosa, food plant of *Trichothrips ilex dumosa* 63, 68
Ragweed. (See *Ambrosia trifida*.)
Rearing Tachinidæ in confinement 110–111
Rearings and dissections of Tachinidæ, results therefrom 95–118
Reproductive capacity of Tachinidæ 109–110
Rheedia lateriflora, food plant of *Asterolecanium greeni* 3
Rhizophora mucronata, food plant of *Paralecanium expansum rotundum* 9
Rhopaloaspis in catalogue of Coccidæ 13
riccæ=Leucaspis riccæ 13
in catalogue of Coccidæ 13
Howardia lobulata a synonym 11
Rhopalosiphum maidis. (See *Aphis maidis*.)
Rice. (See *Oryza sativa*.)
"Rosal," food plant of *Aspidiotus tayabanus* 15
Rosa (*see also* Rose).
sp., food plant of *Pulvinaria coulteri* 6
Rose (see also *Rosa*).
food plant of *Aleyrodes spinifer* 91
Euthrips tritici 40
Rubus (*see also* Blackberry).
food plant of *Sipha rubifolii* 157
cuneifolius, food plant of *Aleyrodes ruborum* 94
fruticosus, food plant of *Aleyrodes rubi* 94
sp., food plant of *Aleyrodes rubicola* 94
spp., Aleyrodidæ infesting them 94
trivialis, food plant of *Aleyrodes ruborum* 94
Rumex altissimus, food plant of *Aphis maidi-radicis* 124
crispus, food plant of *Aphis maidi-radicis* 124
Sage, California. (See *Artemisia californica*.)

Page.
Sagittaria leaves, place of oviposition of *Tabanus stygius*..... 28
Saissetia discrepans in catalogue of Coccidæ..... 9
hemisphærica, host of *Coccophagus flavescens*..... 70
orientalis..... 70
nigra, host of *Coccophagus longifasciatus*..... 81
oleæ, *Cryptothrips californicus* found under old scales..... 41, 67, 68
host of *Myiocnema pallida*..... 69
psidii in catalogue of Coccidæ..... 10
punctulifera in catalogue of Coccidæ..... 10
Salicicola kermanensis. (See *Leucaspis kermanensis*.)
Salix chilensis, food plant of *Ceroplastes schrottkyi*..... 7
persica, food plant of *Leucaspis kermanensis*..... 12
zygostemon, food plant of *Leucaspis kermanensis*..... 12
Sambucus, food plant of *Asterolecanium pustulans sambuci*..... 3
Sanders, J. G., paper, "Catalogue of Recently Described Coccidæ"..... 1–18
Sarcophaga, larviparous habits..... 101
Saw-palmetto, food plant of *Aspidiotus spinosus*..... 14
Scale, black. (See *Saissetia oleæ*.)
brown apricot. (See *Lecanium armeniacum*.)
San Jose, host of *Aphelinus fusciceps*..... 69
Scalesia microcephala, food plant of *Orthezia galapagoensis*..... 3
Schizura, alternate host of introduced Tachinidæ..... 112
concinna, experiment in parasitization by *Zenillia libatrix*..... 100
Sericothrips, characters in table..... 42
description..... 49
apteris, characters in table..... 43
description..... 49–50
food plant..... 50, 67
reticulatus, characters in table..... 43
food plants..... 51, 67
new species, description..... 50–51
stanfordii, characters in table..... 43
food plants..... 51, 67
new species, description..... 51
Setaria, food plant of *Sipha flava*..... 157
glauca, food plant of *Aphis maidi-radicis*..... 124
maidis..... 145
Sipha flava..... 157
viridis, food plant of *Aphis maidi-radicis*..... 124
Shade tree, cultivated, food plant of *Pulvinaria polygonata*..... 6
Silkworm, host of *Crossocosmia sericariæ*..... 99
Sipha bignoniæ, food plants; not a typical *Sipha*..... 157
flava, bibliography..... 167–168
descriptions..... 163–167
distribution..... 157
eggs, description..... 167
female, oviparous, adult wingless, description..... 166
after second molt, description..... 166
third molt, description..... 166
viviparous, adult winged, description..... 165
wingles , description..... 164–165
food plants..... 157
generations, periods and succession..... 157–159

Page.
Sipha flava, life history 156–163
male, adult, description 167
after second molt, description 166–167
third molt, description 167
oviparous generation 161–163
descriptions 165–167
pupa of winged viviparous female, description 165
viviparous generation 159–161
descriptions 163–165
rubifolii on blackberry (Rubus); not a true *Sipha* 157
Sisyropa sp., eggs, uterine 116, 117
Smartweed. (See *Polygonum incarnatum*.)
Soap washes against orange thrips 121
Solidago canadensis, food plant of *Orthezia solidaginis* 3
sp., food plant of *Orthezia solidaginis* 3
Sorghum, food plant of *Aphis maidi-radicis* 124
maidis 145
Sipha flava 157
halpense, food plant of *Sipha flava* 168
Sorrel. (See *Oxalis stricta*.)
Sphærococcus pustulans in catalogue of Coccidæ 4
Spharganium leaves, place of oviposition of *Chrysops mœrens* 38
Spiders, enemies of *Tabanus sulcifrons* 27
Spiræa, food plants of *Aleyrodes fernaldi* 93
Squash, food plant of *Aphis maidi-radicis* 124
Stictococcus in catalogue of Coccidæ 7
sjostedi in catalogue of Coccidæ 8
Stock, live, hosts of *Tabanus sulcifrons* 22
vivax 32
Strawberry, Aleyrodidæ infesting it 93
Strobilanthus sp., food plant of *Phenacaspis strobilanthi* 12
Styphelia sp., food plant of *Ctenochiton serratus* 7
virgata, food plant of *Aspidiotus immaculatus* 13
Sugar cane, Aleyrodidæ infesting it 90
food plant of *Aleyrodes bergi* 70
sp 70
Syzygium pseudo-jambolanum, food plant of *Lepidosaphes ungulata* 17
Tabanidæ, habits and life histories of certain species 19–38
Tabanus atratus, habits and life history 34–36
larva, full-grown, description 35–36
pupa, description 36
lasiophthalmus, adult, description 22
habits and life history 19–22
larva, mature, description 22
pupa, description 22
stygius, adult, description 32
habits and life history 28–32
larva, newly hatched, description 31
pupa, description 31
sulcifrons, adult, description 23
habits and life history 22–28
pupa case, description 28
vivax, adult, description 32–33

Page.
Tabanus vivax, habits and life history 32–34
larva, description 33–34
pupa, description 34
Tachardia albizziæ in catalogue of Coccidæ 6
aurantiaca in catalogue of Coccidæ 6
cærulea in catalogue of Coccidæ 6
fici in catalogue of Coccidæ 6
glomerella in catalogue of Coccidæ 6
sp., host of *Perissopterus javensis* 88
Tachardiinæ in catalogue of Coccidæ 6
Tachina and allies, reproductive capacity 110
clisiocampæ, eggs, uterine 108
life-history notes 106–107
parasite of *Euproctis chrysorrhœa* and *Porthetria dispar* .. 106–107
larvarum, eggs, uterine 108
habits 106
parasite of *Hyphantria cunea* 112
reproductive habits 117
utilis, eggs, uterine 106
habits 106
Tachinas, European, important parasites of *Euproctis chrysorrhœa* 112, 113, 118
Japanese, egg colonization 111
eggs, uterine 108
habits 106
parasites of *Hyphantria cunea* 112
Porthetria dispar 107
Tachinidæ, alternate hosts, new, for introduced species 112–113
bleaching the puparia 115
colonization, improvement in method 111
dissections and rearings, results 95–118
conclusions 118
of native species, results 115–117
eggs, uterine, importance of their study 107–109
larviparous habits of certain species 101–102
probability of extra maggot stage in leaf-ovipositing species 101
rearing them in confinement 110–111
rearings and dissections, results 95–118
conclusions 118
reproductive capacity 109–110
habits, summary 117–118
Tamarix articulata, food plant of *Trabutina elastica* 4
Tangerine, food plant of *Aleyrodes nubifera* 173
Targionia phyllanthi in catalogue of Coccidæ 16
subfervens. (See *Aspidiotus subfervens*.)
Tea plant, food plant of *Saissetia discrepans* 9
Terebrantia, characters in table 42
Theresia tandrec, egg, uterine 117
Thripidæ, characters in table 42
Thrips, characters in table 43
bremnerii, characters in table 44
food plant 60, 68
new species, description 59–60
grass. (See *Euthrips tritici*.)

Page.
Thrips madroñii, characters in table 44
food plants 58, 67
new species, description 57–58
onion. (See *Thrips tabaci*.)
orange 119–122
description of female 121–122
distribution 119
injury, nature and extent 119–120
life-history notes 120
remedies 121
prevalence as affected by soil conditions 120–121
pear. (See *Euthrips pyri*.)
tabaci, characters in table 44
food plants 59, 68
injury to onion 41
Thysanoptera, contribution to a knowledge of those in California 39–68
economic importance 39–41
of California, key to genera 42–43
species 43–45
suborders and families 42
Thysanus, characters in table 72
Tobacco, Aleyrodidæ infesting it 89–90
extract against tobacco thrips 121
Tomato, food plant of *Aleyrodes vaporariorum* 93
Townsend, Charles H. T., paper, "A Record of Results from Rearings and Dissections of Tachinidæ" 95–118
Trabutina in catalogue of Coccidæ 4
elastica in catalogue of Coccidæ 4
Tray, "tanglefooted," use in rearing Tachinidæ 96–97, 110, 115
Triachora unifasciata, eggs, uterine 116
Tricholyga grandis, eggs, uterine 108
habits 106
important parasite of *Euproctis chrysorrhœa* 118
parasite of *Hemerocampa leucostigma* 112
Hyphantria cunea 112
Trichophora ruficauda. (See *Copecrypta ruficauda*.)
Trichothrips characters in table 43
dens, characters in table 44
food plant 61, 68
new species, description 60, 61
femoralis, characters in table 44
food plant 62, 68
new species, description 61–62
ilex, characters in table 44
food plant 63, 68
injury to Christmas berry (*Heteromeles arbutifolia*) 40–41
new species, description 62–63
dumosa, characters in table 44
food plant 63, 68
new variety, description 63
Trionymus hordei in catalogue of Coccidæ 4
nanus in catalogue of Coccidæ 5

Page
Triphleps, presumably *insidiosus*, enemy of *Euthrips citri*. 121
Trixa, larviparous habits. 101
Tubulifera, characters in table. 42
Typha latifolia, egg mass of *Tabanus lasiophthalmus* on leaf. 19
Ugimya sericaria=*Crossocosmia sericariæ*. 99
Uji parasite of silkworm. (See *Crossocosmia sericariæ*.)
Ultracœlostoma in catalogue of Coccidæ. 2
Vaccinium uliginosum, food plant of *Aleyrodes ribium* (?). 94
Vanda hookeriana, food plant of *Parlatoria pseudaspidiotus*. 18
teres, food plant of *Parlatoria pseudaspidiotus*. 18
Varichæta sp., maggots, uterine. 115
Vespa maculata, enemy of *Tabanus sulcifrons*. 26–27
Vetch, food plant of *Euthrips ulicis californicus*. 56, 67
wild, food plant of *Heliothrips fasciatus*. 52, 67
Viburnum (?), food plant of *Aleyrodes citri*. 174
Walnuts, food plants of *Euthrips pyri*. 54, 67
Webstcriella atalantiæ. (See *Parlatoria atalantiæ*.)
Westwoodia hordei=*Trionymus hordei*. 4
Wheat, food plant of *Aphis maidi-radicis*. 124
Sipha flava. 157
"*Wilga*," food plant of *Lepidosaphes wilga*. 17
Xanthium strumarium, food plant of *Aleyrodes* sp. 78
Xanthorrhœa, food plant of *Lepidosaphes pallens*. 87
Xylococcus matumuræ in catalogue of Coccidæ. 2
Zenillia libatrix, eggs, uterine. 109
life-history notes. 100–101
Zygobothria gilva, eggs, uterine. 108
parasite of *Porthetria dispar*, egg. 105
Zygobothria gilva (?) from Japan, parasite of *Porthetria dispar*. 107
nidicola, eggs, ovarian. 108
life-history notes. 105
parasite of *Euproctis chrysorrhœa*. 105

ADDITIONAL COPIES of this publication may be procured from the SUPERINTENDENT OF DOCUMENTS, Government Printing Office, Washington, D. C., at 5 cents per copy

UNIVERSITY OF FLORIDA
3 1262 09229 6168